NPS newsletter

No. 13 A publication of the N.H. DES Watershed Assistance Program Winter 2002
Working to Prevent Nonpoint Source Pollution (NPS)

Nonpoint Source Pollution Project Profile
Innovative Stormwater Technology Installed at Mast Landing in Wolfeboro

by Steve Couture, Watershed Protection Specialist, DES Biology Bureau

Mast Landing in Wolfeboro is a heavily used boat access facility that is the sole public boat launch for Crescent Lake and Lake Wentworth. Unfortunately, untreated stormwater runoff from Route 28 and the surrounding neighborhood resulted in the formation of a sediment plume adjacent to the boat ramp. A N.H. Department of Environmental Services (DES) Watershed Restoration Grant recently addressed this pollution problem by funding the installation of a Vortechs stormwater treatment system at Mast Landing.

Like any successful project, the installation of the innovative Vortechs system was the culmination of the cooperative efforts of project partners, which included the Natural Resource Conservation Service, the Town of Wolfeboro, the N.H. Department of Transportation (DOT), and DES. Planning for the project began with an initial meeting in March of 2000 followed by seven scoping meetings and site inspections. The project partners used this significant investment of time and resources to diligently evaluate various best management

Mast Landing, *continued on page 2*

Cooperation and planning at their best are exhibited during the installation of the Vortechs innovative stormwater treatment system at Mast Landing in Wolfeboro.

Gulfwatch Program monitors the presence of contaminants in New Hampshire marine waters

by Natalie Landry, DES Watershed Assistance Section

This fall, scientists from DES, UNH, and the Coastal Program ventured out into the subtidal zone of the seacoast waters to pull mussels from their beds as part of the Gulfwatch Program. Biologists sloshed in the cold waters at low tide pulling handfuls of mussels from rocks. Later in the laboratory, they removed the mussels from their shells and bottled the meats. The meats will be analyzed for trace metals and toxic organic contaminants such as oils, pesticides, and PCBs.

What is "Gulfwatch"?

This monitoring effort is part of a larger mussel-monitoring program called Gulfwatch, which involves collection of mussels throughout the Gulf of Maine. The Gulf of Maine extends from Cape Sable, Nova Scotia, through New Brunswick, Maine, and New Hampshire to Cape Cod, Mas-

Gulfwatch, *continued on page 4*

Mast Landing

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practice (BMP) options, delegate project tasks and responsibilities, and agree upon a solution to treat the stormwater runoff from the highly impervious drainage area. The Vortechs system was chosen for this site due to its ability to treat the target pollutant, suspended sediment, and its ability to be easily installed as part of the existing drainage system.

The project partners' efforts resulted in a virtually flawless installation of the Vortechs system in November of 2000. Staff from the Wolfeboro Public Works Department and DOT District 3 worked together to install the unit, including the installation of several site BMPs to treat construction related runoff and excavation effluent. The system was online to treat this past winter's runoff and final landscaping at the site was completed this past spring. As a result of the landscaping improvements at the site, the project also included a fringe benefit: a new picnic area with a view of Crescent Lake.

The partnership will continue in 2002 as DES, with the cooperation of the Town, will conduct a study to evaluate the effectiveness of the Vortechs stormwater treatment system. These data will then be made available to communities and other concerned watershed stewards as they select BMPs needed to protect and restore their natural resources.

Special thanks go to Marty Bilafer and Donald Garrepy of the Wolfeboro Public Works Department for supervising the design and installation of the BMPs.

For more information about this project, contact Steve Couture at 271-8801 or scouture@des.state.nh.us. ❒

GreenWorks: Environmental Conservation Articles Available for Your Newsletter

Every month the Watershed Assistance staff produces an environmental conservation article *GreenWorks*, that can be copied or edited and used in your newsletter or other publication. Targeted to the general public, the articles identify simple things people can do at home, work, or within their community to protect water and air quality, reduce pollution, conserve energy, and preserve natural resources. Topics are seasonally relevant, and tend to focus on hot issues that are in the spotlight at the time. Articles come in an attractive one-page format and multiple copies can be obtained for handouts at your next event.

Recent topics include:

- Cleaning New Hampshire's Coast
- Clean Water Makes Summer More Fun
- A Healthy Garden and Lawn Make for a Healthy Watershed
- Start Composting This Spring and Give Something Back to the Earth
- Volunteering to Help New Hampshire's Environment
- Energy Efficiency at Home: It's Easy
- Pollution Prevention Focuses on Environmentally Preferable Purchasing – Shopping for a Better Environment
- Protecting Your Health and the Environment: Safer Alternatives to Backyard Burning

To be put on the *GreenWorks* mailing list or to receive multiple copies, contact Barbara McMillan, at 603/271-7889 or bmcmillan@des.state.nh.us. To view past and current *GreenWorks* or for an electronic version, visit our website at www.des.state.nh.us/gw-list.htm. ❒

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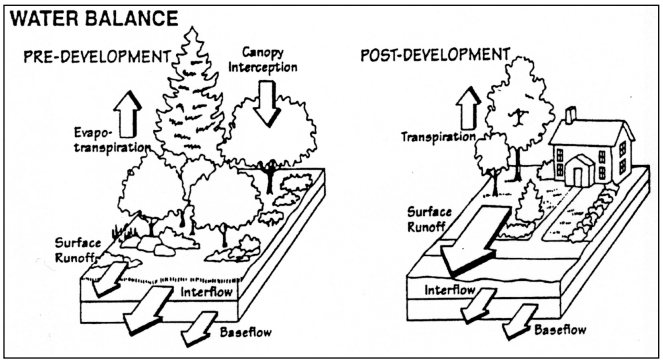
CAROLYN'S CORNER

Managing Stormwater to Protect Groundwater Supplies



Typical pre- and post-development water balance. SOURCE: "Maryland Department of the Environment Stormwater Manual."

In the midst of current drought conditions in many parts of the state, we are reminded that our groundwater supplies are limited and important to protect. As development continues and the amount of impervious surface increases, opportunities for infiltration of rainwater and groundwater recharge are often reduced. In fact, several areas of the state have seen a decline in their groundwater levels – even under normal rainfall conditions – as a consequence of development and traditional stormwater management.

Traditional stormwater management focuses on quickly conveying stormwater from developed areas. As a result, there is little opportunity for infiltration to recharge groundwater supplies. The best way to maintain groundwater supplies is to minimize impervious surface and maximize opportunities for naturally treated stormwater to infiltrate into the ground. Grassed swales and vegetated filter strips are natural infiltration structures, but provide for only limited infiltration and may not be adequate to handle runoff from large areas of impervious surface. In the past, artificial infiltration was discouraged because such structures performed poorly. Today, however, we better understand how to site, design, construct and manage artificial infiltration structures, such as infiltration ponds and trenches, to ensure they continue to function properly over time.

A new guidance document from DES, *Managing Stormwater as a Valuable Resource: A Message for New Hampshire Municipalities and Water Suppliers*, discusses these issues in detail and outlines the requirements for a local program to permit the use of artificial infiltration structures. The guidance provides example applications in New Hampshire, including the ordinances and agreements used, as well as an annotated bibliography.

For more information on this topic and copies of the new guidance document, contact DES's Drinking Water Source Protection Program at 271-7061 or visit the DES website at www.des.state.nh.us/dwspp/stormwater.pdf. ❐

Carolyn Russell works in the Watershed Assistance Section supporting the Mercury Reduction Strategy and efforts to encourage smart growth and control sprawl in New Hampshire.

Summer Interns Get the Job Done & More!

Every summer brings some great interns to the DES Watershed Assistance Section, and this year was no exception. Four enthusiastic, hard working, smart, and experienced students contributed to a summer of water quality fieldwork, nonpoint source special investigations, data entry, education and outreach materials preparation, research and development, and more.

In the beginning of the summer, after an intense interview process with prospective supervisors, interns were selected and matched with the position that best fit their skills and interests. Due to their unique personalities, the interns and their supervisors formed strong bonds from the start. This made for an excellent opportunity for forming friendships as well as exchanging innovative ideas and producing quality work. New "Stream Assessment Protocols" and resource packages were developed for teachers. A flyer was drafted to educate neighborhood residents about the harmful effects of dumping yard waste into a nearby creek. One intern learned

DES intern Jeff Marcoux sorts and identifies aquatic insects during a stream assessment, while earning credits for an independent study project at UNH.

Interns, *continued on page 8*

Gulfwatch

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sachusetts, and includes the Bay of Fundy and Georges Bank.

The Gulf of Maine Gulfwatch was initiated in 1991 with the goal of providing information on the status of environmental quality throughout the Gulf of Maine, which has been affected by centuries of development and industrialization. The information about contaminants found in the mussels is used by environmental and resource managers to evaluate pollution reduction strategies and take action.

Collecting mussels on Pierce Island in Porstmouth.

The New Hampshire Gulfwatch goal is to provide a comprehensive assessment of toxic contaminant exposure, particularly oil, to marine organisms in New Hampshire Seacoast waters. UNH Jackson Estuarine Lab researcher Dr. Steve Jones leads the New Hampshire Gulfwatch and Gulfwide monitoring programs. Working with other Gulf of Maine scientists, Dr. Jones developed the Monitoring Plan for the Gulf of Maine Environmental Quality Monitoring Program that was modeled after the National Oceanic Atmospheric Administration (NOAA) National Status and Trends Mussel Watch program.

Mussels have been used successfully as indicator organisms in environmental monitoring programs throughout the world. Since *Mytilus edulis*, known as the blue mussel, is abundant across the Gulf of Maine and is easy to collect and process, it was a good choice as an indicator for this region. Also, mussels are sedentary, thereby eliminating the complications that scientists might have with mobile species such as fish. The most important reason for using mussels as an environmental indicator is that they are suspension-feeders that pump large volumes of water and concentrate chemicals in their tissues. This function makes the presence of trace contamination easier to document.

Using an indicator species provides scientists with a tool to assess biologically available contamination. This type of contamination is not always apparent by measuring contamination in water or sediment. Measuring the contaminants in the environment and in the animals provides scientists with the types and amounts of contaminants present and the impact that the contaminants are having on marine life.

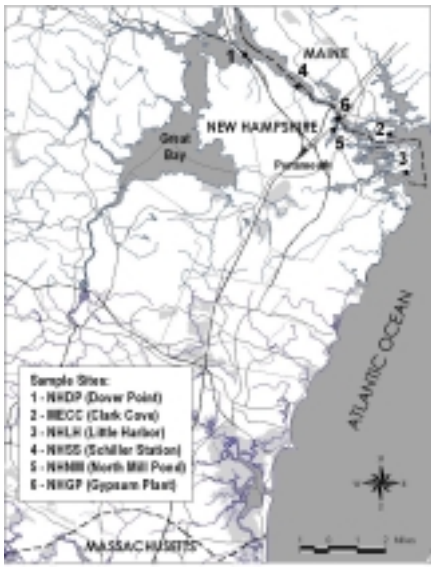
DES increased the number of annual NH Gulfwatch sampling sites in 1998 and 1999 from two to six sites. In 2000 and 2001, two additional mussel monitoring sites were added through funding by the New Hampshire Estuaries Project. Gulfwatch expanded again in 2001 by adding clam and oyster monitoring to the program.

1998 results are in

Results from the 1998 sample collection in New Hampshire are now published in *The New Hampshire Gulfwatch Program: 1998*. The 1998 sites were located on the Piscataqua River (three sites), North Mill Pond, Portsmouth Harbor, and Little Harbor. The mussel tissue was analyzed for 10 metals: silver, aluminum, cadmium, chromium, copper, iron, mercury, nickel, lead, and zinc. The organic contaminants included aromatic hydrocarbons, chlorinated pesticides, and PCBs (polychlorinated biphenyls).

The results of the metals analyses showed that the 1998 metal concentrations in the mussel tissue were within range of concentrations previously found at other New Hampshire sites monitored by the gulf-wide Gulfwatch program from 1991-1998. The one exception was the metal mercury. The mercury concentrations at all 1998 sites exceeded the highest averages for any previously sampled site.

All of the 1998 NH Gulfwatch organic contaminant concentrations



Sample sites for 1998 New Hampshire Gulfwatch.

are within acceptable concentrations for those compounds that have established FDA action limits in shellfish. The metals contaminant concentrations are below both the Canadian and United States action limits for shellfish. Lead concentrations are below but near the FDA Guidance alert level and are thus cause for concern. The highest New Hampshire mercury level was measured at a site on the Piscataqua River, but the concentration was still well below the federal action concentrations.

The organic contaminant analyses showed that all the 1998 organic contaminant concentrations were much greater than the background concentrations from around the Gulf of Maine. Because of the close proximity to industrial sources, especially on the Piscataqua River, it is not surprising that the concentrations were high. The site at Little Harbor had the lowest concentrations of any site for all organic contaminants and the concentrations at four other sites were relatively similar. The fifth site at North Mill Pond had the highest concentrations, especially for pesticides. All organic contaminants measured are highly persistent in the marine environment, thus it is not possible to state if their presence is associated with recent or historic sources.

Limited information is available on human health effects caused by consuming contaminated shellfish. In New Hampshire, there are currently human consumption advisories for mercury (freshwater fish, marine fish, and shellfish) and PCBs (bluefish and lobster tomalley). Visit the N.H. Department of Health and Human Services website at www.dhhs.state.nh.us/CommPublicHealth/RiskAssess.nsf for more information about the advisories.

Impacts of an oil spill in the Piscataqua River

One of the reasons for the comprehensive NH Gulfwatch program was to determine the impact and fate of spilled oil on the marine life of the Great Bay Estuary. In 1996, there was an oil spill from the vessel *Provence* into the Piscataqua River. Approximately 1,000 gallons of #6 fuel oil were dispersed with water currents into nearby areas of Great Bay. The Gulfwatch sampling site on Dover Point, located approximately 2.5 miles upstream of the oil spill site at the confluence of the Piscataqua River and Little Bay, was sampled by the Gulfwatch program before the spill in 1994, and following the spill in 1997 and 1998. In addition, the mussels at the site were tested for oil shortly after the spill (16 days and three months following the spill respectively). The samples were collected to determine if the oil from the spill was taken up by mussels, and how long it took the mussels to eliminate the contaminants over time.

All contaminants detected in the sample collected 16 days after the spill were present at higher concentrations than in all of the other samples, obviously a reflection of the recent exposure of oil pollutants from the *Provence* spill. The 1997 and 1998 Gulfwatch results show that the pollutant concentration of oil-based contaminants had decreased greatly since the sampling that was conducted 16 days after the spill in 1996.

The Gulfwatch program has provided valuable environmental data, including the documentation of the impact of the *Provence* oil spill and the widespread presence of mercury in the estuarine ecosystem. The New Hampshire program and the gulf-wide Gulfwatch are able to provide a regional perspective on marine contamination and the effect that these contaminants have on marine life.

For more information, contact Natalie Landry, DES Coastal Watershed Supervisor at nlandry@des.state.nh.us or 603-433-0877. ❐

Preparing mussels for organic contaminants analysis.

2001 NH Envirothon Winners Place 5th in National Competition

Nonpoint Source Pollution Theme of Contest

With a theme of "Nonpoint Source Pollution — Home and Household," a topic near and dear to us, the DES Watershed Assistance staff are proud to have been a part of this year's exciting Envirothon competition. The Envirothon is a national high school science competition designed to build knowledge in the following five environmental subjects: water resources, forests, soils, wildlife, and a current environmental issue, which varies from year to year. High school students from the U.S. and Canada participate in state/province Envirothon competitions, and the winning team in each regional group is invited to participate in a national competition.

This year, over 200 students from 20 schools competed in the New Hampshire Envirothon. First place went to an enthusiastic team from Keene High School. The students from Keene traveled to Mississippi in July for the national competition, and despite the steamy weather, went on to place fifth out of 49! Although the teams from New Hampshire have always placed in the top 15, this year's impressive finish was the highest ever.

How the Envirothon Works in N.H.

On a mild Saturday in April, the NH Envirothon teams met in Manchester at the Southern New Hampshire University campus and spent the day learning the basics of the five environmental subjects. Professional scientists and environmental specialists presented the material to each team at five different outdoor "stations." On that day, the students were also presented with a "Special Problem" related to the current issue, "Nonpoint Source Pollution – Home and Household." One month later, the teams reconvened for the competition, during which they took exams and gave oral presentations of their solutions to the nonpoint source Special Problem. The exams were given outside (luckily the weather complied!) and required a hands-on approach to problem solving. The students worked with and examined test pit soils, examined and identified trees, listened to and identified wildlife, and analyzed real water quality problems. The Special Problem solutions were presented indoors to a panel of judges composed of environmental professionals.

High school students participating in the 2001 NH Envirothon competition.

The mission of the Envirothon is "to develop knowledgeable, skilled and dedicated citizens who are willing to work towards achieving and maintaining a natural balance between the quality of life and the quality of the environment." It takes a lot of work to put the Envirothon together — almost 100 educators and environmental professionals volunteered to train students, create the exams and the current issue problem, judge presentations, and proctor the tests. But the NH Envirothon is a fun way to give dedicated and enthusiastic students an opportunity to interact with professional scientists and environmental specialists, and work hands-on with material that is often not available in the classroom. The Watershed Assistance staff, in return, enjoyed grappling with the issue of nonpoint source pollution with some of the next generation of New Hampshire's environmental leaders!

The 2002 current issue has the very timely theme: "Introduced Species and Their Effect on Biodiversity," and planning has already begun. For more information about the 2002 Envirothon, contact the NH Envirothon Coordinator, Herb Vadney at 603/279-3436 or vadney@juno.com. For more information about this year's current issue, contact Amy Smagula, DES Exotic Weed Outreach Coordinator at 603/271-2248 or asmagula@des.state.nh.us. ❒

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Coastal Municipalities Doing Their Share to Fix Illicit Discharges

New Hampshire's Coastal waters can appear to be an unlimited resource with so much to offer surrounding communities. Recreation, tourism, wildlife, fishing, shellfish harvesting, business, and residential life, are all dependent on the 18 miles of Atlantic Ocean coastline and the surrounding watershed. Most people don't realize that it is an ongoing struggle to keep these waters clean and healthy for everyone to enjoy to the fullest extent. Although there has been much improvement over the past 30 years, bacteria contamination has continued to cause occasional shellfish bed closures. There are several different sources of bacteria, but contamination can sometimes be traced back to illicit discharges (see sidebar) within the seacoast communities.

In 2000, the N.H. Department of Environmental Services (DES) received funding from the New Hampshire Estuaries Project (NHEP) to administer grants to coastal municipalities to eliminate illicit discharges. As part of this agreement, DES issued $18,000 in grants to Portsmouth, Dover, and Rochester. The grants in these three communities helped improve water quality in the coastal area by reducing bacteria inputs from a variety of urban sources.

In Portsmouth, with a grant of $7,170 and a $10,104 match from the City, a cross connection between the sewer and storm drain systems was removed and eight stormwater catch basins were disconnected from the sanitary sewer system. The City reported that the positive effects of this work were immediately observed during a heavy rainstorm in June — the area did not experience the sewer backups and overflows that had typically occurred in the past during heavy rains.

What is an Illicit Discharge?

An illicit discharge is any discharge into the storm drainage system not composed entirely of storm water. Sources of illicit discharges include: a cross-connection between a sewer line and storm system; a sewage line from a house or business incorrectly connected to a storm system; improper disposal of auto or household toxics; or a laundry or car wash discharge flowing to a storm drain.

In Dover, matching a $6,000 grant with $18,890 of its own funding, the City removed five illicit discharges from commercial and residential buildings and located several other discharges by smoke testing. The smoke testing involved pumping smoke into the storm drain system and noting which houses emitted smoke out of their sewer vent pipes. Smoke coming out of the sewer vent pipe is a sign that the sewage from that building is not going to the right place.

Rochester provided $5,133 to match a $4,800 grant for the purpose of removing two illicit discharges into the city's storm drain system. One project identified a sewer line connecting a four-unit apartment building to a storm drain that emptied directly into the Cocheco River. The second project was a converted garage residence that used a former floor drain to discharge sewage. Wastewater flowed into a storm drain that emptied into Willow Brook, a small tributary to the Cocheco River. The apartment building and the residence are now connected to the city sewer system.

The progress that these three cities have made towards remediating their illicit disharges is very encouraging. The hard work and financial contributions of the three communities involved have made it possible to use the grant money to the fullest extent and make progress towards improving water quality problems in the coastal area.

In 2001-2002, a total of $60,000 will be awarded to municipalities to continue this worthwhile effort. Applications are presently being reviewed and new grant recipients will be selected by the end of this year. Stay tuned for more info on illicit discharge remediation in seacoast communities! ❒

Moose

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- outreach programs that convey any of the above conservation methods to the public

The SCC is a state agency responsible for promoting natural resource conservation and coordinating the activities of county conservation districts. It is made up of a board of 12 members representing the conservation districts, municipal conservation commissions, and agencies responsible for natural resources conservation, including DES.

For more information about the SCC Conservation Grant Program, contact Tracy Degnan, Rockingham County Conservation District at 679-2790, or via e-mail at rccdted@ttlc.net, or watch for posting of the grant application packet at www.mooseplate.com. ❒

Interns

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how to use a Global Positioning System device and logged information on storm drainage outfalls, while another helped hunt down illicit connections on the Seacoast. Many tasks were analyzed from different perspectives and streamlined for increased efficiency.

The Summer 2001 Watershed Assistance Section interns were:

- **Christine Weston**, DES Coastal Watershed Restoration Assistant, Water Resource Management major at UNH.
- **Eric Rachkowski**, DES Watershed Investigator, Water Resource Management major at UNH.
- **Jeff Marcoux,** DES Watershed Investigator, Water Resource Management major at UNH.
- **Rayann Richard,** DES Municipal Storm Drainage Investigator, Biochemistry major at Bates College.

The Watershed Assistance Section strives to make the experience an exciting opportunity for interns. Interns can start to form a foundation for a future career in the environmental field, network with potential contacts for future jobs, learn hands-on how to apply their talents and education to job related responsibilities, and explore opportunities to help make decisions that will shape the rest of their lives.

DES's intern program offers many different summer job opportunities. Information on DES intern programs is available in April from DES Human Resources at 271-8875. For interning with the Watershed Assistance Section specifically, contact Barbara McMillan at 271-7889. ❒

The Moose is Loose!
New Grant Funding Available From Conservation Plates

Funds raised through sales of the new conservation license plate are now available to local and county conservation groups as grants from the State Conservation Committee (SCC). A request for proposals has been issued by the SCC for the new Conservation Grant Program. About $80,000 will be awarded in grants this year, with proposals due in January 2002.

While revenues from the moose plate are used to fund conservation programs in various state agencies, the Conservation Grant Program is the only opportunity for local organizations to use moose plate funds for conservation programs. The SCC will have two grant programs, one for county conservation districts and county cooperative extension natural resource programs, and one for local conservation grants implemented by municipal conservation commissions, schools, scout groups, or other non-profit entities.

The purpose of the Conservation Grant Program is to support and promote programs and partnerships throughout the state that protect, restore, and enhance the state's valuable natural resources. The grants are to be used for physical and tangible environmental projects that foster stewardship and sustainability of New Hampshire's natural environment.

Eligible projects include:

- water quality or wildlife habitat preservation
- watershed protection
- soil erosion or flood prevention
- improvements to property acquired for conservation purposes
- land management planning for conservation purposes

Moose, *continued on page 7*

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